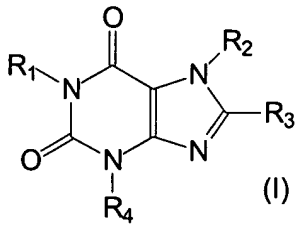
Amendments to the Claims:

1. (Original) A compound of formula (I):

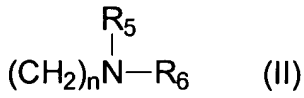


(I)

wherein

R_1 is a branched or straight chain C_1-C_8 alkyl;

R_2 is of the formula (II),

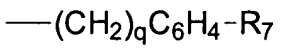


(II)

wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,

wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;

R_3 is of the formula (III),

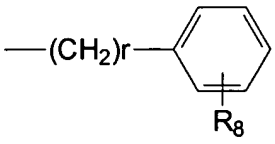


(III)

wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;

wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;

R_4 is of the formula (IV),



(IV)

wherein r is an integer ranging from 1 to 8 and R_8 is ortho or meta and is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$

wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,

R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and;

salts, solvates, and hydrates thereof.

2. (Original) The compound according to Claim 1, wherein R_1 is C_3 alkyl; R_2 is $-(CH_2)_2N(CH_2CH_3)(CH_2)_2OH$; R_8 is NH_2; R_7 is H; R_8 is NH_2; f is 0; n is 2; q is 1; and r is 2.

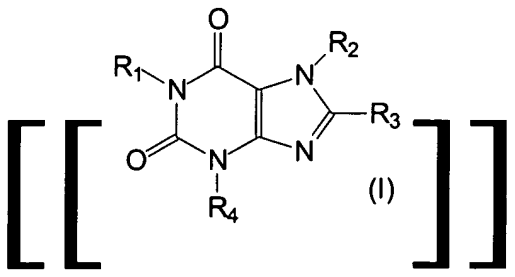
3. (Original) The compound according to Claim 1, wherein R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is NH_2; f is 0; R_8 is NH_2; n is 2; q is 1; and r is 2.

4. (Original) The compound according to Claim 1, wherein R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is H; R_8 is NH_2; f is 0; n is 2; q is 1; and r is 2.

5. (Original) The compound according to Claim 1, wherein R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is H; R_8 is $(CH_2)_sOH$ wherein s is 2 and $R_{10}COOH$, wherein R_{10} is CH=CH; n is 2; q is 1; and r is 2.

6. (Original) The compound according to Claim 1, wherein R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is $(CH_2)_tOH$ wherein t is 2 and R_9COOH, wherein R_9 is CH=CH; R_8 is NH_2; f is 0; n is 2; q is 1; and r is 2.

7. (Currently amended) A diagnostic assay-type probe comprising a compound according to claim 1; ~~of the compound (I):~~

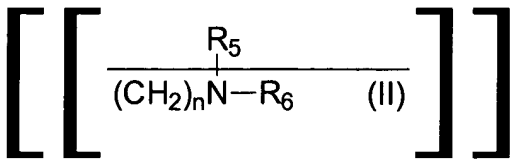


(I)

~~wherein~~

~~R_1 is a branched or straight chain C_1-C_8 alkyl;~~

~~R_2 is of the formula (II),~~

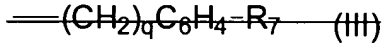


(II)

~~wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,~~

~~wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;~~

~~R_3 is of the formula (III),~~

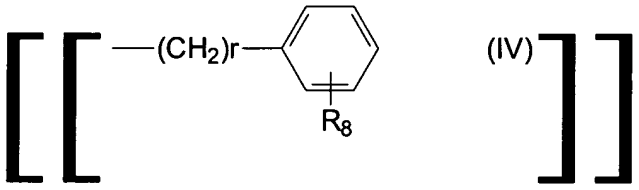


(III)

~~wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;~~

~~wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;~~

~~R_4 is of the formula (IV),~~



(IV)

~~wherein r is an integer ranging from 1 to 8 and R_8 is ortho or meta and is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$;~~

~~wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,~~

~~R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and; salts, solvates, and hydrates thereof;~~

wherein the compound is labeled by a radioactive or non-radioactive material thereon or optionally connected to the compound of formula (I) by a spacer component present thereon, wherein the spacer component has functionality which bonds to the amine, hydroxyl, or carboxyl functionality present on the R_7 or R_8 substituent of the compound.

8. (Original) The assay-type probe according to Claim 7, wherein said non-radioactive material is a fluorescent dye.

9. (Original) The assay-type probe according to Claim 7, wherein said non-radioactive material is biotin.

10. (Original) The assay-type probe according to Claim 7, wherein said non-radioactive material is a luminescent dye.

11. (Original) The assay-type probe according to Claim 7, wherein said non-radioactive material is obelin.

12. (Original) The assay-type probe according to Claim 7, wherein R_1 is C_3 alkyl, R_5 is $CH_3(CH_2)_p$; p is 1; R_7 is H; R_8 is NH_2; f is 0; n is 2; q is 1; r is 2; and R_6 is $(CH_2)_mOH$; m is 2; and the non-radioactive material is biotin bonded to the hydroxyl group present on R_6.

13. (Original) The assay-type probe according to Claim 7, wherein R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is NH_2; f is 0; n is 2; q is 1; r is 2; R_8 is NH_2; and the non-radioactive material is biotin bonded to the amino group present on R_8.

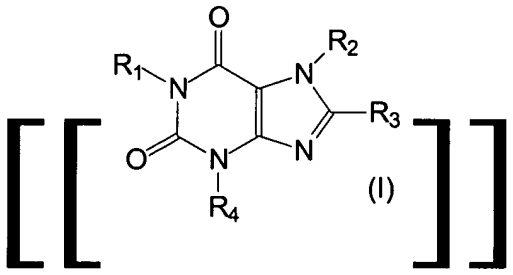
14. (Original) The assay-type probe according to Claim 7, wherein R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is H; n is 2; q is 1; r is 2; and R_8 is

$R_{10}COOH$, wherein R_{10} is an alkylene or alkenylene group having 1 to 8 carbon atoms; and the non-radioactive material is biotin bonded to the carboxyl group present on R_8.

15. (Original) The assay-type probe according to Claim 7, wherein the compound is labeled by the radioactive material connected by a spacer component, and the spacer component has functionality which bonds to the amine, hydroxyl, or carboxyl functionality present on the R_7 or R_8 substituent of the compound.

16. (Original) The assay-type probe according to Claim 7, wherein the compound is labeled by the radioactive material and the radioactive material is a radioactive isotope selected from the group consisting of ^{18}F, tritium, ^{11}C, ^{13}C, and ^{15}N; a complex of a metal atom or complex of a metal ion, a chelating agent, or ^{125}I.

17. (Currently amended) An imaging agent for adenosine receptors comprising a compound according to claim 1; ~~of Formula (I):~~

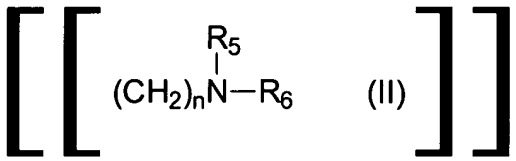


(I)

~~wherein~~

~~R_1 is a branched or straight chain C_1-C_8 alkyl;~~

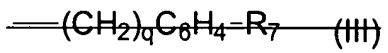
~~R_2 is of the formula (II),~~



~~wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,~~

~~wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;~~

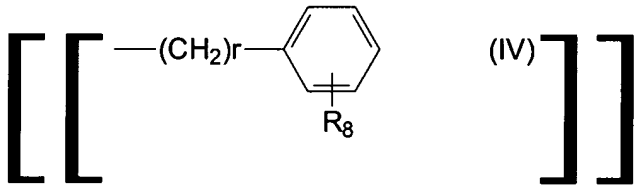
~~R_3 is of the formula (III),~~



~~wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;~~

~~wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;~~

~~R_4 is of the formula (IV),~~



~~wherein r is an integer ranging from 1 to 8 and R_8 is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$~~

~~wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,~~

~~R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and;~~

~~salts, solvates, and hydrates thereof~~ wherein at least one of its atoms or one or more atoms bonded thereto are ~~radioactively~~ radioactive, spin labeled, or both ~~radioactively~~ radioactive and spin labeled.

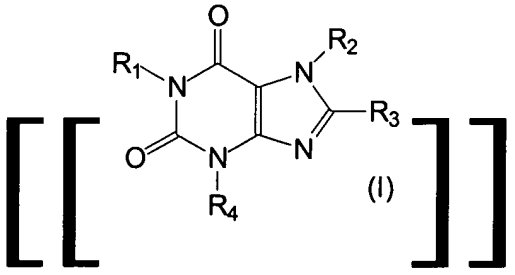
18. (Original) The imaging agent of according to Claim 17 wherein the marker atom is a nuclear spin labeled.

19. (Original) The imaging agent of according to Claim 18 wherein the marker atom is a ^{19}F.

20. (Original) The imaging agent of according to Claim 17 wherein the marker atom is a radioactive isotope.

21. (Original) The imaging agent of according to Claim 17 wherein the radioactive isotope is ^{18}F, ^{11}C, ^{15}N, ^{125}I, or ^{3}H

22. (Currently amended) A method of treating A_1 adenosine receptor related disorders in a mammal in need of treatment thereof, comprising administering an effective amount of a compound according to claim 1, ~~of formula (I):~~

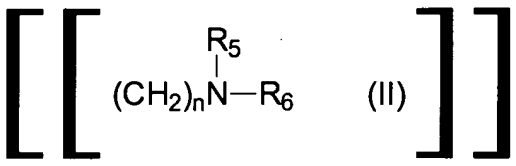


(I)

~~wherein~~

~~R_1 is a branched or straight chain C_1-C_8 alkyl;~~

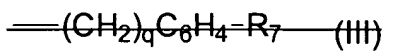
~~R_2 is of the formula (II),~~



~~wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,~~

~~wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;~~

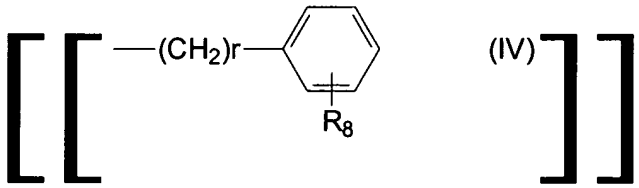
~~R_3 is of the formula (III),~~



~~wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;~~

~~wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;~~

~~R_4 is of the formula (IV),~~



~~wherein r is an integer ranging from 1 to 8 and R_8 is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$~~

~~wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,~~

~~R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and;~~

or a pharmaceutically acceptable salt ~~salts~~, solvate ~~solvates~~, or hydrate ~~and hydrates~~ thereof, or a combination of compounds according to claim 1 ~~of formula (I)~~, optionally in combination with one or more other therapeutic agents, to the mammal in need thereof.

23. (Original) The method according to Claim 22 wherein for the compound of formula (I) R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is $(CH_2)_mOH$ wherein m is 2; R_7 is H; R_8 is NH_2; f is 0; n is 2; m is 2; q is 1; and r is 2.

24. (Original) The method according to Claim 22 wherein for the compound of formula (I) R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is NH_2; R_8 is NH_2; f is 0; n is 2; q is 1; and r is 2.

25. (Original) The method according to Claim 22 wherein for the compound of formula (I) R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is H; R_8 is NH_2; f is 0; n is 2; q is 1; and r is 2.

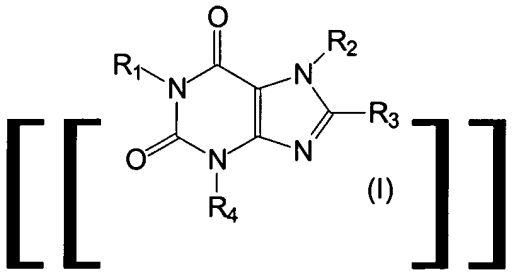
26. (Original) The method according to Claim 22 wherein for the compound of formula (I) R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is H; R_8 is $(CH_2)_sOH$ wherein s is 2 and $R_{10}COOH$, wherein R_{10} is CH=CH; n is 2; q is 1; and r is 2.

27. (Original) The method according to Claim 22 wherein for the compound of formula (I) R_1 is C_3 alkyl; R_5 is $CH_3(CH_2)_p$ wherein p is 1; R_6 is H; R_7 is $(CH_2)_tOH$ wherein t is 2 and R_9COOH, wherein R_9 is CH=CH; R_8 is NH_2; f is 0; n is 2; q is 1; and r is 2.

28. (Original) The method according to Claim 22 wherein the A_1 adenosine receptor related disorder is congestive heart failure, hypertension, ischemia-reperfusion organ injury, endotoxin-related tissue injury, renal failure, Alzheimer's disease, depression, obesity, asthma, diabetes, cystic fibrosis, allergic conditions, autoimmune disorders, inflammatory disorders, chronic obstructive pulmonary disorders, chronic cough, coronary artery disease, biliary colic, postoperative ileus, fibrosis, sclerosis, Adult Respiratory Distress Syndrome (ARDS), acquired immunodefiency syndrome

(AIDS), Acute Lung Injury (ALI), acquired immunodefiency syndrome (AIDS), Severe Acute Respiratory Syndrome (SARS), septicemia, substance abuse, drug dependence, or Parkinson's disease and the mammal is a human.

29. (Currently amended) A pharmaceutical composition comprising ~~which comprises~~ a compound according to claim 1, ~~of Formula (I):~~

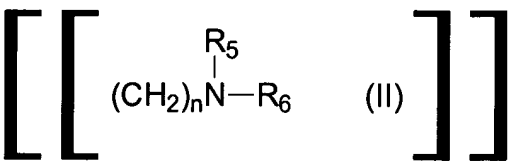


(I)

~~wherein~~

~~R_1 is a branched or straight chain C_1-C_8 alkyl;~~

~~R_2 is of the formula (II),~~

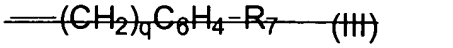


(II)

~~wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,~~

~~wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;~~

~~R_3 is of the formula (III),~~

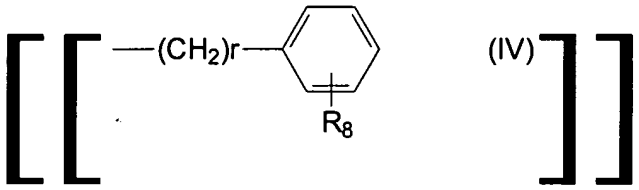


(III)

~~wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;~~

~~wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;~~

~~R_4 is of the formula (IV),~~



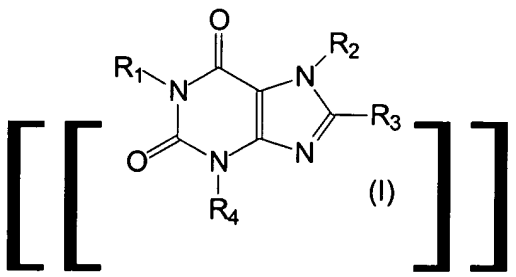
~~wherein r is an integer ranging from 1 to 8 and R_8 is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$~~

~~wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,~~

~~R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and;~~

or a pharmaceutically salt ~~salts~~, solvate ~~solvates~~, or hydrate ~~and hydrates~~ thereof and a pharmaceutically acceptable carrier.

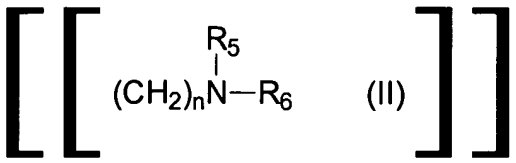
30. (Currently amended) A prodrug comprising a compound according to claim 1. ~~of the compound of the formula (I):~~



~~wherein~~

~~R_1 is a branched or straight chain C_1-C_8 alkyl;~~

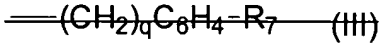
~~R_2 is of the formula (II),~~



~~wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,~~

~~wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;~~

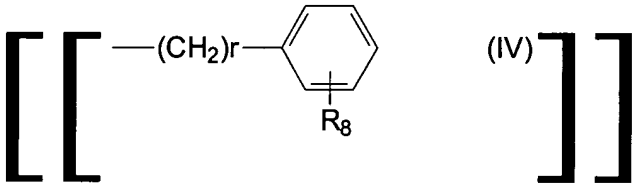
~~R_3 is of the formula (III),~~



~~wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;~~

~~wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;~~

~~R_4 is of the formula (IV),~~



~~wherein r is an integer ranging from 1 to 8 and R_8 is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$~~

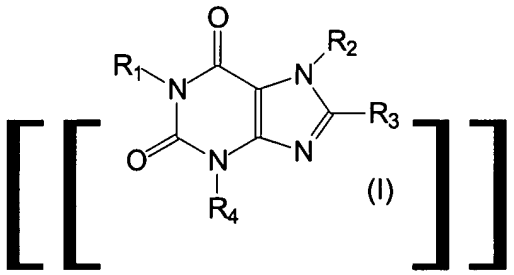
~~wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,~~

~~R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and;~~

~~salts, solvates, and hydrates thereof.~~

31. (Currently amended) A method of treating an A_1 adenosine receptor related disorder in a patient in need of treatment thereof, comprising administering an effective amount of a prodrug according to claim 30, or a pharmaceutically acceptable salt, solvate, or hydrate thereof, optionally in combination with one or more other therapeutic agents, to the patient in need thereof. ~~The method of administering an appropriate amount of a prodrug of Claim 30 to a patient in need thereof.~~

32. (Currently amended) A method of preparing a compound of claim 1, the method comprising: ~~formula (I):~~

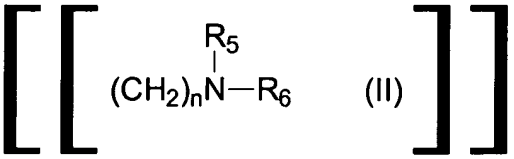


(I)

~~wherein~~

~~R_1 is a branched or straight chain C_1-C_8 alkyl;~~

~~R_2 is of the formula (II),~~



(II)

~~wherein n is an integer ranging from 1 to 8; R_5 is H or $(CH_2)_pCH_3$, and R_6 is H or $(CH_2)_mOH$,~~

~~wherein p is an integer ranging from 1 to 7 and m is an integer ranging from 1 to 8;~~

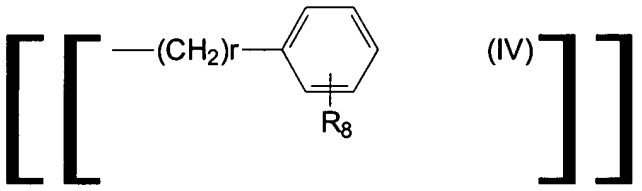
~~R_3 is of the formula (III),~~

~~$-(CH_2)_qC_6H_4-R_7$ (III)~~

~~wherein q is an integer ranging from 1 to 8; and R_7 is selected from the group consisting of H, OH, NH_2, $(CH_2)_tOH$, and R_9COOH;~~

~~wherein R_9 is a straight or branched chain alkylene or alkenylene group having 1 to 8 carbon atoms, and t is an integer ranging from 1 to 8;~~

~~R_4 is of the formula (IV),~~

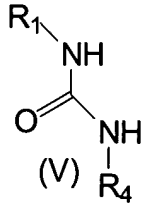


~~wherein r is an integer ranging from 1 to 8 and R_8 is selected from the group consisting of H, OH, $(CH_2)_fNH_2$, $(CH_2)_sOH$, and $R_{10}COOH$~~

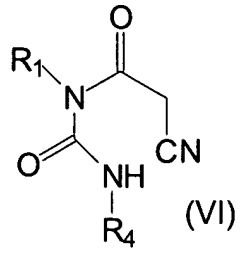
~~wherein f is 0 or f and s are independently integers ranging from 1 to 8; and,~~

~~R_{10} is a C_1-C_8 straight or branched chain alkylene or alkenylene; and; salts, solvates, and hydrates thereof comprising:~~

condensing R_4-NH_2 with R_1NCO to yield a substituted ~~ureas~~ urea of formula (V)

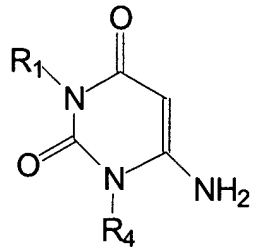


condensing a substituted urea of formula (V) with cyanoacetic acid to yield a ~~compounds~~ compound of formula (VI),



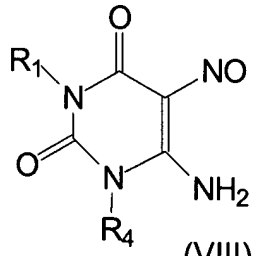
(VI)

converting a compound of formula (VI) by treatment with strong base to yield a compound of formula (VII),



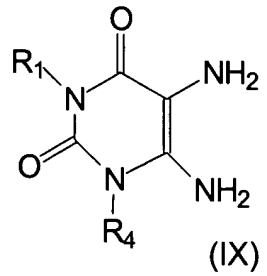
(VII)

reacting a compound of formula (VII) with $NaNO_2$ under acidic conditions to yield a compound of formula (VIII)



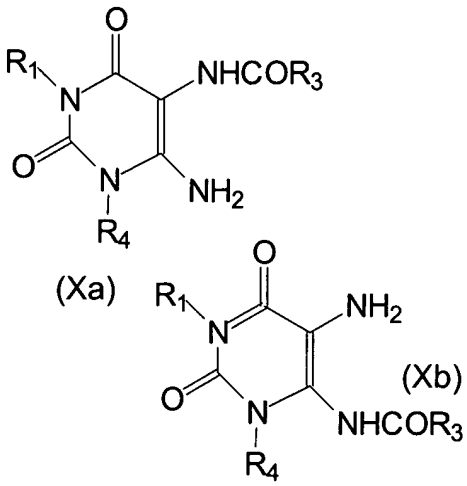
(VIII)

reducing a compound of formula (VIII) to produce a compound of formula (IX)

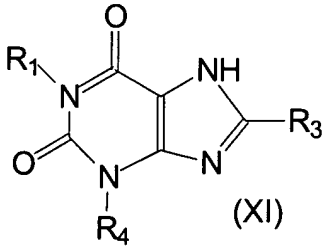


(IX)

condensing a compound of formula (IX) with R_3-CO_2H a compound of either formula (Xa) or (Xb),



cyclizing a compound of formula (Xa) or (Xb) in the presence of a strong base to form a compound of formula (XI), and



(XI)

reacting a compound of formula (XI) with L-R2, wherein L is a leaving group, to yield a compound of formula (I).

33. (Currently amended) The compound according to Claim 1, wherein the compound is: ~~which is:~~

3-[2-(2-Aminophenyl)ethyl]-8-benzyl-7-(2-methylamino)ethyl-1-propylxanthine,
3-[2-(3-Aminophenyl)ethyl]-8-benzyl-7-(2-methylamino)ethyl-1-propylxanthine,
3-[2-(2-Aminophenyl)ethyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine,
3-[2-(3-Aminophenyl)ethyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine,
3-[2-(2-Aminophenyl)ethyl]-7-(2-ethylamino)ethyl-8-[4-(2-hydroxyethyl)]benzyl-1-propylxanthine,
3-[2-(3-Aminophenyl)ethyl]-7-(2-ethylamino)ethyl-8-[4-(2-hydroxyethyl)]benzyl-1-propylxanthine,
8-(4-Aminobenzyl)-3-[2-(2-aminophenyl)ethyl]-7-[2-ethylamino]ethyl-1-propylxanthine,
8-(4-Aminobenzyl)-3-[2-(3-aminophenyl)ethyl]-7-[2-ethylamino]ethyl-1-propylxanthine,
3-[2-(2-Aminophenyl)ethyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine,
3-[2-(3-Aminophenyl)ethyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine,
3-[2-(2-Aminophenyl)ethyl]-8-benzyl-7-[2-methyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
3-[2-(3-Aminophenyl)ethyl]-8-benzyl-7-[2-methyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
3-[2-(2-Aminophenyl)ethyl]-8-benzyl-7-[2-ethyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
3-[2-(3-Aminophenyl)ethyl]-8-benzyl-7-[2-ethyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
8-(4-Aminobenzyl)-3-[2-(2-aminophenyl)ethyl]-7-[2-ethyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
8-(4-Aminobenzyl)-3-[2-(3-aminophenyl)ethyl]-7-[2-ethyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
3-[4-(2-Aminophenyl)butyl]-8-benzyl-7-[2-ethyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,

3-[6-(2-Aminophenyl)hexyl]-8-benzyl-7-[2-ethyl(2-hydroxyethyl)-amino]ethyl-1-propylxanthine,
3-[4-(2-Aminophenyl)butyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine,
3-[6-(2-Aminophenyl)hexyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine,
3-[4-(3-Aminophenyl)butyl]-8-benzyl-7-[2-ethyl(2-hydroxyethyl)amino]ethyl-1-propylxanthine,
3-[6-(3-Aminophenyl)hexyl]-8-benzyl-7-[2-ethyl(2-hydroxyethyl)-amino]ethyl-1-propylxanthine,
3-[4-(3-Aminophenyl)butyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine or
3-[6-(3-Aminophenyl)hexyl]-8-benzyl-7-(2-ethylamino)ethyl-1-propylxanthine.